**Architecture On Mars**

**BUILDING A COMMUNITY LIVING SPACE ON MARS**
**A COMMUNITY DRIVEN APPROACH TO ARCHITECTURE**

**WORKSHOP GOALS:**

1. **The designers understand & respond to the physical context of Mars**

2. **They design to meet the needs of the community**

3. **Arrangements of the buildings foster community**

    a. **Foster frequent and meaningful contact**
    b. **Promotes a sense of comfort**
    c. **Supports the needs of the community**

4. **Internal environments are health giving and inspiring**

**PHONE MEETING:** One week prior to the workshop**.**
**Wednesday Sept. 14 - 3:00 PM**

Goal: Set the context for the workshop

1. Ask students to watch the provided video before calling in to telecon.
   -Video Content
      •The Mars Show DVD (available through Imagine Mars team)

2. TELECON TALKING POINTS
   Two Imagine Mars Team Members + Mars Scientist (available through Imagine Mars team)

   • Discuss the NASA vision of space exploration and what we are doing to make it happen.

   • Answer questions from students

   • WORKSHOP SET UP:

   Inform the student designers that they will be given a NASA mission to execute in 1 week.

   We can't tell you right now but we can say that it has something to do with surviving on Mars and we need your help. You will receive a letter instructing you on how to prepare for your mission.

**FOLLOW UP LETTER**

**Letter reads:**
*You have been selected as a NASA Designer. To prepare you must show up at the Resource Center, September 19th with one of the following things:*

1. *Something that provides comfort*
2. *Something that helps you communicate*
3. *Something that keeps you healthy*

**Day 1:**
**Introduction Game, "Earth Moon Mars Balloons" (from Imagine Mars online resources): 5:00 – 5:10**
**Imagine Mars Design Challenge Video Presentation 5:10 -5:15**
**Main Activity Group 1: 5:15-6:00**
*(Break 5 min at 6:00 pm)*
**Main Activity Group 2: 6:00 – 6:45**
**Wrap up: 6:45 – 7:00**

**Goal: End the day with a WANT/DON'T WANT list.**

**1. Introduction Game: Earth Moon Mars Balloons Activity**

2. Watch Imagine Mars Design Challenge: DVD of Mars Scientist reading the "Mission" the students will embark on. (Please see Design challenge on next page.)

4. What are some things have heard about Mars? Fast paced, students call out what they know.

5. Instructions on Activity 1

- Separate into 2 groups
  - Group A with Solar System Ambassador (available at: http://www2.jpl.nasa.gov/ambassador/ )
  - Group B with Architect/Designer of Academy Homes

**Part 1 (5:15 - 5-45)** : Begin with picture chart of Earth/Mars comparisons

• Students get a couple pictures to hold. Image cards show many different images of the Mars environment, other show many images of Earth.

• Solar System Ambassador asks one of the students to come up and hold a card.
Speaking to the group. Do you think this is a picture of Mars or Earth?

• Use the pictures as talking points and discuss how Mars is different from Earth, and learn about characteristics of Mars. After each picture is talked about it should be taped to the wall either on the Earth or Mars side.

Images can be grouped according to whether they show Mars or Earth. Also,
talking about an Image of Earth can prompt questions of what would be the equivalent
on Mars. Who is holding that picture? Comparisons between Mars and Earth create natural transitions in

conversation, and allow the students to interact with the pictures they are holding.

• This activity should end with all of the Mars pictures grouped together on the wall.

**Part 2 (5:45 - 6:00) : Develop a Want/Don't Want chart. (aka solutions to problems chart)**

The Want /Don't Want chart is meant to describe the things that you want your architectural design to include. The "Don't Want" column describes the problems of living on Mars(solar radiation, no oxygen, etc.), the "Want" column describes the solutions that the students come up with.

For example, We **don't want** to get fried by the extreme solar radiation, so we **want** to have a dome or windows with UV protection.

**Step 1:** What would you have to deal with if you were living on Mars? This is a review of what the students just learned. Create a list describing the environmental factors of Mars. (use the large post it pads of paper, on the wall, to write out the list of problems associated with living on Mars, UV radiation, no oxygen, plants can not grow in the soil, etc)

**Step 2:** Then consider each problem from the list and brainstorm ideas on how you are going to solve these problems in your design. Write each solution on a separate large Post it pad in the wall. Make sure that the problem/solution connection is clear. For example, lets say the first "problem" you talk about is that you can't breathe the atmosphere. What are you going to do about that? have a short brainstorm with the students exploring that problem. Write their "design solution" to the problem on a pad a paper on the wall.

The students should end with a number of "design solutions" to creating a community in the environment of Mars.

See example of **Want/Don't Want chart on next page.**

**Group B: COMMUNITY NEEDS**

**Activity: MATCHING GAME (what is a community?)**

Start out with a stack of cards with many different pictures of people doing different things.

- •Singers
- •Dancers
- •High fashion models
- •Blind people
- •Women who knit
- • Basketball players

Have a variety of pictures and each category/theme - each should have 3 - 4 pictures?

Ask the students to group them together in the communities that they think these people share.

- First, group the images by matching what the people do?

- Then, ask the students if there is any other way that they can group the people? How about by age? How about by location?

- Are there any other ways to group the pictures that show a community?

**WHAT IS A COMMUNITY?**
It is a group of people that share a common interest or location.

Take the picture cards of the choir singers and separate them?
What do you think would happen if these singers were 10,000 miles apart from each other?
Could they still sing together?

**What do you think a community needs to make it stronger?**
**A community needs a place to come together and share ideas, talk and be together.**

What about this community?
What features in the design of this place helps to bring the community together?
Why? What do you like?
What would you like to change?
*(phone meeting Wed. Sept 14, noon, with Diane Georgopolis to discuss how she wants to approach this question and answer section)*

**WANT/DON'T WANT chart.**

What Architectural features do they want to have (in their Mars design) that fosters their community?

What don't they want?

**Groups A and B exchange.**

Day 1: Wrap up:

Ask the students teams to present what they have in their want columns and why?

**Students make sure to put WANT/DON'T WANT chart on the wall where they will stay**

**throughout the week for reference.**

**Day 2**
**5:00 -5:10 Intro Activity "Wantcolumn City"**
**5:00 – 5:30 Main Activity "Planning your Mars Community Layout:**
**5:30-6:40** *(Break 5 min at 6:00 pm)*
**Wrap up: 6:40 – 6:50**

**Goal for the day:**
**1. End the day with a design layout of their city.**
**2. Elements of the design refer to their want column**

**1. WANTCOLUMN CITY ACTIVITY:** *Break students up into groups of two:*

**MATERIALS:** cotton balls, straws, stir sticks, paper cups, pens, tape
*(Jay Lee, David, Jackie, Osayi roam and help)*

Create a city that incorporates as many things in the want columns (day 1 charts) as you can in 20 minutes. Remember that there are 2 want columns to consider.
1. One deals with the environment of Mars
2. The other deals with designing your community.

- Pass out a 1 foot square piece of cardboard
- Use only the materials provided.

**2. REVIEW CITY LAYOUTS** *(Jay Lee provides design supportive design comments)*

As a individual groups, have the designers discuss how their design addresses some aspect of what they have in the community "Want Column" lists.

**This is a good time to reinforce the problem/solution connections the students make .**

**3.** *Activity:* **PLANNING YOUR MARS COMMUNITY LAYOUT**
*(Stay in the same groups of two)*

Give clear directions using examples for this part. Show the students that they want to end up with a birds eye view of where there community living buildings will be placed in the city.

Use the example from the community want column:

*If we want to have the design of the buildings to allow for a lot of community interaction, what are some ways that we can place the buildings to make that happen?*

Instruct the students to start combining the best ideas from the Wantcolumn City layouts.

Create a Floor plan/blueprint of how you want your city to look.

Remember that the design should follow the list of wants from your want column.

You should end up with a birds eye view of the layout. **SEE EXAMPLE.**

**4. WRAP UP**

Have the students present/explain their layouts and how their design connects to their want column.

**DAY 3:**

***Warm up Activity "Play around with Sketchup" 5:00 -5:10***
***Sketch up Tutorial "Build a House" 5:10-5:50***
***Main Activity " Make their Layouts 3D": 5:50-6:50***
***Wrap up: 6:50 – 7:00***

**GOAL FOR THE DAY:**

1. Become familiar with moving within the 3-D environment.
2. Understand what each tool is used for on the tool bar.

Software Instruction:

**1. INITIAL ACTIVITY/ PLAY AROUND WITH SKETCHUP**
(Pre made landscape for the training area will be provided)

David to give very brief description of the Tools in Sketchup then let the students work on their own.

- 5 minute basic tool into
- 5 minutes of play time with Sketchup.

Q & A; What did they designers learn?

**2. 45 MIN. WORK ALONG TUTORIAL.**

Design a house with

- 1 door
- 2 windows
- 3 Trees
- 4 people

**3. ONE HOUR TO WORK ON THEIR DESIGN**
(Pre made landscape for the mars environment will be provided)

- Import their layout from day 2
- Show them how to turn a 2-D layout into 3-D buildings

**Day 4:**

***Warm up Activity "Pictionary" 5:00 -5:15***
***Architectural Details to their Design 5:15-6:30***
***Labeling Features: 6:30-6:50***
***Wrap up: 6:50 – 7:00***

**Goal for the day:**

1. End the class with a 3-D structure that follows the 2-D layout
2. Label features

Students continue to work on Mars community design and add to the following features.

- Structural details
- Color

•Texture
•Labeling
•Shadows

David will do a demo on labeling key features.

**Day 5:**

***Warm up Video "Animation of MER Landing" 5:00 -5:10***
***How to Animate Your 3D Design 5:10-5:40***
***Audio Recording Team Descriptions of Design Features 5:40-6:30***
***Final Presentation Party: 6:30 – 7:00***
***Hand out certificates of completion.***

**Goal for the day:**

1. Show the designers how to create an animation
2. Record the designer's explanation of the features
3. Design review/party
    a. Invite families
    b. Imagine Mars Certificates of completion & Thank You

**Warm up Video "Animation of MER Landing"**
Conversation highlights what it took to make the video. What Animation software is and different types of software out there.

Does anyone have any other examples where you see computer animation?

**How to Animate Your 3D Design**
Students learn how to make a flyby animation.
David and Jackie will lead a walk through tutorial of how to use the tab feature of Sketchup.

This activity will conclude with the students generating a Quicktime movie of their animation.

**Audio Recording Team Descriptions of Design Features**
What are the features of the community and why did they design it that way?
David and Jackie will record the students talking about their design.

Student designers will all present their work and receive certificates of completion.

**Final Presentation Party:**
All the student animations will be loaded onto my laptop to be presented via the projector. Students will comment on their design in front of the group. Diane (check availability) will comment on the success of their designs.

David will pass out certificates of completion and thank everyone.